

IN THE CLAIM

1    1. (Currently Amended) A method for managing a memory system having a plurality of  
2       subsystems, comprising the steps of:

3              upon accessing the subsystems for a piece of data used by a first process,  
4              determining ~~the an~~ access time to acquire the piece of data in the  
5              memory system;  
6              comparing the determined access time to a threshold; and  
7              taking an action based on ~~the~~ results of the comparing step;

8       wherein

9              ~~accessing the subsystems is in a non-sequential order~~  
10             a value of the threshold is selected based on whether the value is a  
11             realistic time for a memory access;  
12             a memory table includes entries pointing to data blocks storing data  
13             for at least one subsystem;  
14             the entries are used to locate the data stored in the data blocks; and  
15             while the first process is being executed, the memory table working  
16             with a memory manager managing the data blocks  
17             independent of an operating system working with the  
18             memory system and independent of a processor working  
19             with the memory system.

1    2. (Currently Amended) The method of claim 1 wherein a data block[s] containing the  
2       piece of data is placed in the memory system based on information selected in one  
3       or a combination of:  
4              a movement pattern of data in [a] the data block,

5           a structure of the memory system, and  
6           a cache-level architecture in the memory system.

1       3. (Canceled)

1       4. (Canceled)

1       5. (Currently Amended) The method of claim 1 further comprising the steps of:  
2           using a memory table having entries pointing to data blocks storing data  
3           for the memory system; and  
4           the memory table using a physical address of a memory page  
5           corresponding to the piece of ~~a~~ccess data to convert to a location  
6           address corresponding to an entry pointing to the location of the  
7           piece of ~~a~~ccess data.

1       6. (Currently Amended) A method for managing a memory system, comprising the steps  
2           of:  
3           upon accessing the memory system for a piece of data used by a first  
4           process,  
5           a processor working with the memory system continuing its  
6           functions until it is stalled;  
7           comparing ~~the a~~ time taken to complete the memory access to a  
8           threshold; and  
9           if the time taken to complete the memory access is close to, equal  
10          to, or greater than the threshold, then taking an action based  
11          on results of the comparing step; a value of the threshold

1       7. (Original) The method of claim 6 wherein the action is selected in one or a combination  
2                  of  
3                  postponing executing the first process and allowing executing a second  
4                  process;  
5                  causing the first process to be switched to a second process; and  
6                  causing a performance monitor on the memory system or on a system  
7                  using the memory subsystem.

1       8. (Original) The method of claim 6 further comprising the step of polling a latency  
2           manager for the time taken to complete the memory access; the latency manager  
3           being part of managing the memory system.

1        9. (Currently Amended) The method of claim 6 further comprising the steps of:  
2              using a memory table having entries pointing to data blocks storing data  
3                      for at least one subsystem; and  
4              using the entries to locate the ~~aceess~~ data stored in the data blocks.

1       10. (Currently Amended) The method of claim 9 wherein, while the first process is being  
2           executed, the memory table working with a memory manager managing the data  
3           blocks independent of a processor working with the memory system and  
4           independent of an operating system working with the memory system.

1    11. (Currently Amended) A method for managing a memory system, comprising the  
2    steps of:  
3                 upon accessing the memory system for a piece of data used by a first  
4                 process  
5                 counting a time elapsed from the time the data access starts; the  
6                 counted time being increased as the data is being accessed;  
7                 comparing the counted time to a threshold; a value of the threshold  
8                 is selected based on whether the value is a realistic time for  
9                 a memory access; and  
10                ~~if the counted time is close to, equal to, or greater than the~~  
11                ~~threshold, then~~ based on results of the comparing step, taking an  
12                action selected in one or a combination of  
13                 postponing executing the first process and allowing  
14                 executing a second process;  
15                 causing the first process to be switched to a second process;  
16                 and  
17                 causing a performance monitor on the memory system or on  
18                 a system using the memory system.

1    12. (Original) The method of claim 11 further comprising the steps of:  
2                 using a memory table having entries pointing to data blocks storing data  
3                 for at least one memory subsystem; and  
4                 using the entries to locate the access data stored in the data blocks.

1    13. (Currently Amended) A computer-readable medium embodying instructions for a  
2       computer to perform a method for managing a memory system having a plurality  
3       of subsystems, the method comprising the steps of:

4              upon accessing the subsystems for a piece of data used by a first process,

5              determining ~~the an~~ access time to acquire the piece of data in the  
6              memory system;

7              comparing the determined access time to a threshold; and

8              taking an action based on ~~the~~ results of the comparing step;

9       wherein

10             ~~accessing the subsystems is in a non-sequential order~~

11             a value of the threshold is selected based on whether the value is a  
12             realistic time for a memory access;

13             a memory table includes entries pointing to data blocks storing data  
14             for at least one subsystem;

15             the entries are used to locate the data stored in the data blocks; and

16             while the first process is being executed, the memory table working  
17             with a memory manager managing the data blocks  
18             independent of an operating system working with the  
19             memory system and independent of a processor working  
20             with the memory system.

1    14. (Currently Amended) The computer-readable medium of claim 13 wherein a data  
2       block[s] containing the piece of data is placed in the memory system based on  
3       information selected in one or a combination of:

4              a movement pattern of data in [a] the data block,

5              a structure of the memory system, and

6 a cache-level architecture in the memory system.

1 15. (Canceled)

1 16. (Canceled)

1 17. (Currently Amended) The computer-readable medium of claim 13 wherein the method  
2 further comprises the steps of:

3 ~~using a memory table having entries pointing to data blocks storing data~~  
4 ~~for the memory system; and~~

5 the memory table using a physical address of a memory page  
6 corresponding to the piece of ~~aeeess~~ data to convert to a location  
7 address corresponding to an entry pointing to the location of the  
8 piece of ~~aeeess~~ data.

1 18. (Currently Amended) A computer-readable medium embodying instructions for a  
2 computer to perform a method for managing a memory system, the method  
3 comprising the steps of:

4 upon accessing the memory system for a piece of data used by a first  
5 process,

6 a processor working with the memory system continuing its  
7 functions until it is stalled;  
8 comparing ~~the a~~ time taken to complete the memory access to a  
9 threshold; a value of the threshold being selected based on  
10 whether the value is a realistic time for a memory access;  
11 and

12                   ~~if the time taken to complete the memory access is close to, equal~~  
13                   ~~to, or greater than the threshold, then based on results of the~~  
14                   ~~comparing step, taking an action.~~

1     19. (Original) The computer-readable medium of claim 18 wherein the method further  
2       comprises the step of polling a latency manager for the time taken to complete the  
3       memory access; the latency manger being part of managing the memory system.

1     20. (Currently Amended) The computer-readable medium of claim 18 wherein the method  
2       further comprises the steps of:  
3               using a memory table having entries pointing to data blocks storing data  
4               for at least one subsystem; and  
5               using the entries to locate the ~~aeeess~~ data stored in the data blocks.

1     21. (Currently Amended) A computer-readable medium embodying instructions for a  
2       computer to perform a method for managing a memory system, the method  
3       comprising the steps of:  
4               upon accessing the memory system for a piece of data used by a first  
5               process,  
6               counting a time elapsed from the time the data access starts; the  
7               counted time being increased as the data is being accessed;  
8               comparing the counted time to a threshold, a value of the threshold  
9               being selected based on whether the value is a realistic time  
10              for a memory access; and

11                   if the counted time is close to, equal to, or greater than the  
12                   threshold, then based on results of the comparing step, taking an  
13                   action selected in one or a combination of  
14                   postponing executing the first process and allowing  
15                   executing a second process;  
16                   causing the first process to be switched to a second process;  
17                   and  
18                   causing a performance monitor on the memory system or on  
19                   a system using the memory subsystem.

1       22. (Currently Amended) The computer-readable medium of claim 21 wherein the method  
2                   further comprises the steps of:  
3                   using a memory table having entries pointing to data blocks storing data  
4                   for at least one memory subsystem; and  
5                   using the entries to locate the access data stored in the data blocks.

1       23. (Currently Amended) An apparatus for managing a memory system having a plurality  
2                   of subsystems, comprising:  
3                   means for, upon accessing the subsystems for a piece of data used by a first  
4                   process,  
5                   determining the an access time to acquire the piece of data in the  
6                   memory system;  
7                   comparing the determined access time to a threshold; and  
8                   taking an action based on the results of the comparing step;  
9                   wherein  
10                  accessing the subsystems is in a non-sequential order

11           a value of the threshold is selected based on whether the value is a  
12           realistic time for a memory access;  
13           a memory table includes entries pointing to data blocks storing data  
14           for at least one subsystem;  
15           the entries are used to locate the data stored in the data blocks; and  
16           while the first process is being executed, the memory table working  
17           with a memory manager managing the data blocks  
18           independent of an operating system working with the  
19           memory system and independent of a processor working  
20           with the memory system.

1       24. (Currently Amended) The apparatus of claim 23 wherein a data block[s] containing  
2           the piece of data is placed in the memory system based on information selected in  
3           one or a combination of:  
4            a movement pattern of data in [a] the data block,  
5            a structure of the memory system, and  
6            a cache-level architecture in the memory system.

1       25. (Canceled)

1       26. (Canceled)

1       27. (Currently Amended) The apparatus of claim 23 ~~further comprising a memory table~~  
2           ~~having entries pointing to data blocks storing data for the memory system; wherein~~  
3           the memory table using a physical address of a memory page corresponding to the

4 piece of access data to convert to a location address corresponding to an entry  
5 pointing to the location of the piece of access data.

1 28. (Currently Amended) An apparatus for managing a memory system, comprising:  
2 upon accessing the memory system for a piece of data used by a first  
3 process,  
4 a processor for working with the memory system and for  
5 continuing its functions until it is stalled;  
6 means for comparing ~~the a~~ time taken to complete the memory  
7 access to a threshold; a value of the threshold being selected  
8 based on whether the value is a realistic time for a memory  
9 access; and  
10 means for taking an action ~~if the time taken to complete the~~  
11 ~~memory access is close to, equal to, or greater than the~~  
12 ~~threshold based on results of comparing.~~

1 29. (Original) The apparatus of claim 28 further comprising means for polling a latency  
2 manager for the time taken to complete the memory access; the latency manger  
3 being part of managing the memory system.

1 30. (Currently Amended) The apparatus of claim 28 further comprising a memory table  
2 having entries pointing to data blocks storing data for at least one subsystem; the  
3 entries being used to locate the access data stored in the data blocks.

1 31. (Currently Amended) An apparatus for managing a memory system, comprising:

2                   upon accessing the memory system for a piece of data used by a first  
3                   process,  
4                   means for counting a time elapsed from the time the data access  
5                   starts; the counted time being increased as the data is being  
6                   accessed;  
7                   means for comparing the counted time to a threshold, a value of the  
8                   threshold being selected based on whether the value is a  
9                   realistic time for a memory access; and  
10                  ~~if the counted time is close to, equal to, or greater than the~~  
11                  ~~threshold,~~ means for taking an action selected in one or a  
12                  combination of  
13                  postponing executing the first process and allowing  
14                  executing a second process;  
15                  causing the first process to be switched to a second process;  
16                  and  
17                  causing a performance monitor on the memory system or on  
18                  a system using the memory subsystem.

1       32. (Currently Amended) The apparatus of claim 31 further comprising a memory table  
2                   having entries pointing to data blocks storing data for at least one memory  
3                   subsystem; the entries being used to locate the access data stored in the data  
4                   blocks.

1       33. (New) The method of claim 5 wherein the physical address of the memory page is  
2                   converted from a virtual address of the piece of data.

1    34. (New) The computer-readable medium of claim 17 wherein the physical address of  
2                the memory page is converted from a virtual address of the piece of data.

1    35. (New) The apparatus of claim 27 wherein the physical address of the memory page is  
2                converted from a virtual address of the piece of data.